

In the Drawings

Applicant submits herewith a new sheet of drawing containing Figure 1a, which illustrates the claimed invention. This drawing contains pictorial representations of subject matter disclosed and claimed in the application as filed and thus does not constitute new matter.

REMARKS**ASSERTION OF SMALL ENTITY STATUS**

Pursuant to 37 CFR 1.27(c)(1)(i)-(iii), applicant hereby asserts that it is a small entity and is entitled to small entity status. This assertion is signed hereinbelow by the attorney of record, pursuant to 37 CFR 1.27(c)(2)(i). Accordingly, applicant is entitled to pay Patent Office fees at the reduced, small entity rate.

Petition for Extension of Time Under 37 CFR 1.136(a)

It is hereby requested that the term to respond to the Examiner's Action of August 10, 2009 be extended one month, from November 10, 2009 to December 10, 2009.

The Commissioner is hereby authorized to charge the extension fee, and any additional fees associated with this communication to Deposit Account No. 50-4364.

Claims 11 to 16, 18 to 23, 25, 26, 28, 29, 31 to 48, 51 to 54, 56, 57, 59 and 61 to 64 are pending in the application, and the Examiner rejected all claims.

Interview

On November 24, 2009, Examiner Chang conducted an in-person interview in which Dr. Joachim Bradl and Mark Simpson were present. The Applicant wishes to thank Examiner Chang for her courtesy and professionalism during the interview and Applicant believes that significant progress resulted from this interview.

During the interview, clarity issues were discussed and it was agreed that the subject matter of the pending application would be better understood by amending the description and drawings to clarify the "image plane" as discussed in the specification. Possible amendments were discussed and it was agreed that clarification could be made without

adding new matter, and thus it was agreed that Applicant would prepare such an amendment and add an additional drawing to effect this clarification.

The attached amendments are submitted pursuant to the discussions held in the interview. Applicant submits that the amendments provided herein are substantively the same as the amendments discussed with the Examiner Chang during the interview, and which all agreed did not constitute new matter to the with respect to the application as originally filed.

It was agreed also that Applicant should submit an additional drawing as Fig. 1A, to provide an enlarged view of the focusing lens system 2 of Fig. 1. The additional drawing is filed together with this response. To explain the additional Fig. 1A, further amendments to the specification have been made. These amendments add additional clarity to the changes discussed during the interview. None of the amendments, nor the added drawing, add new matter to the application. Accordingly, the Examiner is respectfully requested to enter these amendments and the new drawing Figure.

It was also agreed that (a) one fundamental feature of the disclosed invention is that the viewing window is provided in the image plane, the image plane being the location where an observer places at least one eye to view the holographic reconstruction representing the three-dimensional scene, and (b) another fundamental feature of the disclosed invention is making the reconstructed image focused at a point before the focal point of the optical system (or image plane of the light source).

The §112 Rejections

On page 2 of the Office Action, the Office rejected claim 16 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Examiner states:

"... The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification fails to teach why the holographic reconstruction representing the three dimensional scene is described by Fresnel transformation and not by Fourier transformation."

In view of the amendments to the specification discussed above and the discussions held during the interview, it is now made clearer that the plane where the hologram bearing medium is located in the device is a Fourier plane. Further, it is also clearer that the image plane or viewing plane is located in an inverse Fourier plane, and this also where the viewing window is generated and where the observer places his/her eye in order to see the reconstructed three-dimensional scene. These two planes correspond to each other via an inverse Fourier transformation. In the present application, the reconstructed three-dimensional scene (e.g. shown with reference numeral 6 and comprising single point 7 in Fig. 3) is located between the hologram bearing medium 3 and the image plane 4. The representation of the reconstructed three-dimensional scene can't be described with a Fourier transformation, because this location is neither a Fourier plane nor an inverse Fourier plane of the display device. A person skilled in the art knows, however, that the light wave propagation and the actual state of the light distribution between two corresponding Fourier planes can be described by a Fresnel transformation. Therefore, the reconstructed three-dimensional scene – being located between the hologram bearing medium 3 and the image plane 4 – can be described by the Fresnel transformation. This is the reason why the specification of the pending application teaches the feature claimed with claim 16.

Because amended *claim 11* includes, – among others – the following features:

- (a) the optical system generating an inverse Fourier transform of the hologram encoded

on the hologram-bearing medium at the image plane of the light source (being the viewing plane 4);

(b) the image plane of the light source is the location where the optical system images the light source; and

(c) the image plane is also the location where the viewing window is provided, being the location where an observer places at least one eye to view the holographic reconstruction representing the three-dimensional scene,

stating with slightly other words the same content that has now been clarified, the Examiner is respectfully requested to reconsider and withdraw the rejection of claim 16 under 35 U.S.C. § 112.

The §103 Rejection

On page 3 of the Office Action, the Office rejected claims 11 to 16, 18 to 23, 25, 26, 28, 29, 31 to 48, 51 to 54, 56, 57, 59 and 61 to 64 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 7,230,746 to Cameron et al.

As discussed in the interview, agreement was reached that a fundamental feature of the claimed invention is that the viewing window is provided in the image plane, the image plane being the location where an observer places at least one eye to view the holographic reconstruction representing the three-dimensional scene. This plane is also the location where the optical system images the light source. Further, the optical system generates an inverse Fourier transform of the hologram encoded on the hologram-bearing medium at the image plane of the light source.

In Cameron, the image plane of the light source, as shown in Figs. 1, 6a and 6b and described in the respective description, is the focal plane of the lens (indicated by the dotted

lines), being spaced apart from the lens by the focal length f . This is also an inverse Fourier plane of the lens. In other words, in Cameron that is where the reconstructed three-dimensional scene is located. The viewing plane or viewing region where the observer places his/her eyes in order to see the reconstructed three-dimensional scene is spaced *apart from* that plane, as indicated with reference numeral 4 in Fig. 1 of Cameron et al. or as shown in Fig. 6a and 6b. Therefore, the method of generating holograms and the display device according to Cameron et al. is configured such that the *reconstructed three-dimensional scene* is located at and around the image plane of the light source (and the eye of the observer is spaced apart from this plane), whereas the method of generating holograms and the display device according to the invention claimed herein is configured such that the location where an observer *places at least one eye to view the holographic reconstruction representing the three-dimensional scene* is the image plane of the light source. This is explicitly claimed with the independent claims 11 and 41. These features are novel over the prior art.

Further, these features are not merely a design parameter for a person skilled in the art to modify, because this involves a substantial different image forming concept for the generation of the three-dimensional scene than has been known or used in the past. There is no teaching, suggestion or motivation disclosed in Cameron et al. to alter the method of generating holograms and the display device in such a fundamental way such that the claimed conditions are met. Accordingly, it is submitted that the claimed invention is novel and non-obvious over the prior art, and the examiner is respectfully requested to reconsider and withdraw the rejection of the claims based on the prior art.

The Double Patenting Rejections

On pages 6 through 8 of the Office Action, the Office made various provisional obviousness-type double patenting rejections of Claims 11 to 16, 18 to 23, 25, 26, 28, 29, 31 to 48, 51 to 54, 56, 57, 59 and 61 to 64, as follows:

Over claims 1-22 of copending Application No. 11/427,629

Over claims 1-21 of copending Application No. 11/313,989

Over claims 1-24 of copending Application No. 11/427,645

Over claims 1-26 of copending Application No. 11/427,644

Over claims 1-19 of copending Application No. 11/937,991

The Office additionally made an obviousness-type double patenting rejection of Claims 11-6, 18-23, 25-26, 28-29, 31-48 and 51-54, 56-57, 59 and 61-64 over claims 1-19 of U.S. Patent No. 7,315,408.

Applicant will, as appropriate, file one or more Terminal Disclaimers to overcome these rejections upon an indication of allowable subject matter.

Summary

In view of the foregoing amendments and remarks, applicant respectfully requests entry of the amendments, favorable reconsideration of the application, withdrawal of all rejections and objections and that claims 11 to 16, 18 to 23, 25, 26, 28, 29, 31 to 48, 51 to 54, 56, 57, 59 and 61 to 64 be allowed at an early date and the patent allowed to issue.

The Commissioner is hereby authorized to charge the extension fee and any additional fees associated with this communication to applicant's Deposit Account No. 50-4364.

Respectfully submitted

December 10, 2009
Date

/Mark D. Simpson/
Mark D. Simpson, Esquire
Registration No. 32,942

SAUL EWING LLP
Centre Square West
1500 Market Street, 38th Floor
Philadelphia, PA 19102-2189
Telephone: 215 972 7880
Facsimile: 215 972 4169
Email: MSimpson@saul.com